

Research Article

# The Level of Rubella Infection in Women with Recurrent Abortion

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## I N F O

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## A B S T R A C T

**Introduction:** Rubella infection causes some health problems in pregnant women.

**Method:** The current case-control study was suggested to detect the rubella infection level in women with recurrent abortion. The study was conducted on 65 patients who had suffered from abortion and 30 healthy women.

**Results:** The results variables showed significant differences in birth numbers and in recurrent abortion percentages. All women in the current study suffered from abortion in the first trimester and about 60% of them suffered from abortion in the second trimester. Non-significant variations were seen in age in both groups and in age categories distribution. The rubella IgG levels according to study groups, occupation, smoking and age categories recorded non-significant differences between study groups ( $p=0.570$ ). The rubella IgG levels showed non-significant differences ( $p=0.217$ ) with abortion and birth numbers, significant differences in the number of births ( $p=0.000$ ) and abortions in women with recurrent abortion ( $p=0.029$ ). Rubella showed a weak positive correlation with the number of abortions in the first trimester and in the second trimester. Rubella IgG level didn't affect all women in the current study who suffered from abortion in the first trimester and affected 60% of the women who suffered from abortion in the second trimester. This was non-significantly associated with the rubella IgG level ( $p=0.727$ ).

**Conclusion:** The present study concluded that rubella didn't have any role in abortion and in recurrent abortion.

**Keywords:** Rubella Infection, Recurrent, Abortion, Women, First Trimester, Second Trimester

## Introduction

The infection by the rubella virus (Togaviridae family) causes an acute or mild viral illness.<sup>1</sup> The infection is spread through droplets. After an incubation period of about 14 days, clinical symptoms like rashes usually appeared followed by mild fever and sore throat. Sometimes arthralgia, orchitis, and inflammation of nerves may appear.<sup>2</sup> Infection with the Rubella virus during early pregnancy has been found to be associated with teratogenic effects and spontaneous abortion.<sup>3</sup> It is common in low-income countries because vaccination is not extensively implemented there. Children, young people, women of childbearing age, and pregnant women are the main infected people.<sup>4,6</sup> Pregnant women infected with rubella in the first trimester may experience spontaneous abortion. Several cases of spontaneous abortions were found to be associated with infections from viruses like rubella, parvovirus B19, cytomegalovirus, and other agents during pregnancy.<sup>7,8</sup> In addition to infection in newborns, the rubella virus has been seen to cause miscarriage, congenital ophthalmic or foetal death, and auditory defect if it occurs in early pregnancy in some developing countries.<sup>9,10</sup>

## Methodology

### Sample Collection and Study Design

This is a case-control study implemented in Baghdad city. Blood samples were collected from women who had undergone abortions and had attended Al-Elwia hospital in Baghdad city for 4 months (June to September). Data and sample collection were performed after written consent was obtained from each patient. The sample size was calculated using sample size calculator. The present study included 65 patients who had suffered from abortion (recurrent abortion). The control group included 30 healthy women with healthy births. Data included age, number of births, smoking, number of abortions, and time of abortion (first, second and recurrent abortion).

### Exclusion Criteria

The current study excluded women with alcohol intake, cancer, diabetes mellitus, hypertension, contraception, and anti-anxiety drug abuse.

Rubella IgG level was detected by ELISA (Biokit, Spain) kit. Results were represented as mean  $\pm$  SE, and other descriptive data were represented as percentages. Independent sample t-test, correlation coefficients and ANOVA one-way analysis were used and values were considered significant at p less than 0.05.

## Results and Discussion

The variables of study subjects showed significant differences in birth number ( $p=0.025$ ) and recurrent abortion percentages (OR 135.3902; CI 95%, 7.8889 -

2323.5879) ( $p=0.000$ ). The results showed that all women in the current study suffered from abortion in the first trimester and about 60% of them suffered from abortion in the second trimester. 60% of women suffered from abortion in both trimesters. Non-significant variation was seen in age in both groups ( $p=0.809$ ). Among the participants who had undergone abortion, maximum (50%) were less than 29 years of age, and in the control group, maximum (43.33%) were in the age group of 30-39 years (Table 1).

**Table 1. Study Variables of Participants**

Study Variables	Control Group	Abortion Group	Significant value
Age (year)	30.20 $\pm$ 1.219	30.57 $\pm$ 0.85	0.809*
Birth (number)	2.44 $\pm$ 0.320	1.57 $\pm$ 0.211	0.025*
Abortion (number)	0	3.86 $\pm$ 0.219	-
First trimester			
Yes	0	65 (100%)	-
No	0	0 (0%)	-
Second trimester			
Yes	0	39 (60%)	-
no	0	26 (40%)	-
First and second trimesters		39 (60%)	
Recurrent			
Yes	0 (0%)	45 (69.23%)	0.000**
No	30 (100%)	20 (30.76%)	
Age categories (years)			
< 29	10 (33.33%)	32 (50%)	0.228-9***
30-39	13 (43.33%)	24 (37.5%)	
< 40	7 (23.33%)	8 (12.5%)	

\*Independent sample t-test

\*\*Odd ratio (CI 95%)

\*\*\* Chi-square test

The rubella IgG levels according to occupation, smoking, and age categories in both groups have been shown in Table 2. There were non-significant differences between study groups ( $p=0.570$ ). Rubella IgG levels weren't affected by occupation in patients ( $p=0.658$ ) and control group ( $p=0.727$ ). Smoking also didn't impact the rubella IgG level in patients ( $p=0.756$ ) and control group ( $p=0.131$ ). Age

categories showed non-significant differences in patients ( $p=0.407$ ) and control group ( $p=0.218$ ) (Table 2).

**Table 2. Rubella IgG Levels according to Occupation and Smoking in Study Groups**

Groups	Control Group	Patients Group
Rubella IgG level	$1.85 \pm 0.229$	$1.751 \pm 0.105$
p*	0.570	
Occupation		
Yes	$1.81 \pm 0.11$	$1.75 \pm 0.105$
No	$1.89 \pm 0.185$	$1.85 \pm 0.22$
p*	0.727	0.658
Smoking		
Yes	$2.38 \pm 0.268$	$1.71 \pm 0.184$
No	$1.79 \pm 0.098$	$1.78 \pm 0.33$
p*	0.131	0.756
Age categories (year)		
< 29	$1.83 \pm 0.191$	$1.70 \pm 0.161$
30-39	$1.89 \pm 0.138$	$1.88 \pm 0.112$
< 40	$1.72 \pm 0.20$	$1.70 \pm 0.22$
p**	0.218	0.407

\*Independent sample t test, p-value less than 0.05

\*\*ANOVA one-way p value less than 0.05

Non-significant differences were seen in rubella IgG levels and occurrence of abortions ( $p=0.217$ ) and significant differences were seen in rubella IgG levels and number of births ( $p=0.000$ ) and number of abortions ( $p=0.029$ ) (Table 3).

**Table 3. Association between Rubella IgG Levels and Number of Births and Abortions**

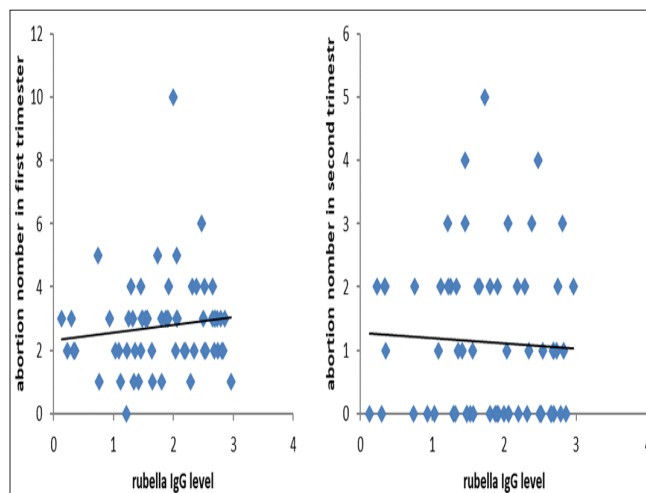
Recurrent Abortion	Yes	No	p
Rubella	$1.69 \pm 0.122$	$1.95 \pm 0.137$	0.217
Number of births	$0.68 \pm 0.113$	$3.40 \pm 0.37$	0.000
Number of abortions	$4.17 \pm 0.28$	$3.15 \pm 0.243$	0.029

Independent sample t test, p-value less than 0.05

Rubella had a weak positive correlation with number of abortions in the first trimester ( $r=0.055$ ,  $p=0.674$ ), and a weak positive correlation in the second trimester ( $r=0.007$ ,  $p=0.555$ ) as shown in Figure 1.

Rubella IgG level didn't affect all women in the current study who suffered from abortion in the first trimester and affected 60% of the women who suffered from abortion in

the second trimester. This was non-significantly associated with the rubella IgG level ( $p=0.727$ ) (Table 4).



**Figure 1. Correlation between Rubella and Number of Abortions in the First and Second Trimesters of Pregnancy**

**Table 4. Rubella IgG Level according to the Trimester in which Women Suffered Abortion**

Pregnancy Trimester	Rubella IgG Level
First	
Yes	$1.85 \pm 0.229$
No	0
Second	
Yes	$1.75 \pm 0.132$
No	$1.82 \pm 0.139$
p*	0.727
First and second trimesters	$1.85 \pm 0.229$

\*Independent sample t test at p-value less than 0.05

## Discussion

The present study aims to analyse the association of rubella infection with recurrent abortion in women. The results didn't find any change in the rubella IgG levels between patients and control groups. A few studies found that a poor pregnancy outcome was associated with viral infections during pregnancy.<sup>7,11</sup> Infection with the rubella virus in the first trimester of pregnancy has been found to be a contributor to spontaneous abortion. The present study was suggested to investigate the causes of abortion in some Iraqi women who suffered from recurrent abortion. In another study,<sup>12</sup> it was found that a significant proportion of women were acutely infected with the rubella virus ( $p=0.003$ ). Mirambo et al.<sup>13</sup> found that the range the rubella infection was 2.1-47.1%. They found a significant role of this virus in spontaneous abortion and this didn't agree with the

present finding. Lulandala et al.<sup>9</sup> found low percentages of rubella virus infection among women who had undergone abortion having a mean age of  $26.3 \pm 5.6$  years residing in urban areas (AOR: 5.65, 95% CI: 1.15-27.77,  $p=0.035$ ) that may be contributing to a poor pregnancy outcome.

Occupation, smoking, and age didn't affect the rubella IgG levels in the present study and this agrees with another study conducted in Kirkuk city in Iraq by Mohammed<sup>14</sup> who didn't find any effect of age (25-34 years) on the seroprevalence of anti-rubella IgM and IgG in the studied groups that were divided into three categories (< 25, 25-34 and > 34 years).

The recurrent abortion wasn't affected by rubella IgG levels in the present findings. The same conclusion was drawn by Hussein and Balatay<sup>15</sup> who reported a low prevalence of some microorganism infections like toxoplasmosis (2.82%), CMV (2.27%), and rubella IgM (1.73%) in women who had undergone abortion which lead to conclude that infections with these microorganisms are not major causes of abortion in the Kurdistan Region of Iraq.

The findings of some other studies didn't agree with the present results. In Iran, more than 96% of the recruited women were positive for anti-rubella IgG,<sup>16</sup> and in Turkey, about 55% of women were found to be positive for rubella test.<sup>17</sup> However, another report observed that about 75.3% and 1.2% of women who suffered from abortion were positive for rubella IgG and IgM.<sup>18</sup>

Rubella IgG levels didn't have any effect on women during their pregnancy. The cause of abortion in the present study may not be rubella infection but other like microorganism infections including CMV, toxoplasmosis, bacterial infection, and genetic factors in some cases. Moreover, it was observed in a study that recent and past exposure to rubella was not influenced by the trimester of pregnancy,<sup>19</sup> as was previously reported in Nigeria.<sup>20,21</sup> The risk of vertical transmission to the foetus in case of rubella occurrence in the first trimester of pregnancy is much higher (90%).<sup>22</sup> There was no treatment available for active rubella infection; therefore a routine prenatal screening would help detect the infection.

### Limitations

The limitations of the current study are restricted sample size because the study included women who attended the general hospital only during the study period, and there was difficulty in obtaining cases of active rubella infection in pregnant women during the study period. Also, all samples were from urban areas.

### Conclusion

The present study concluded that rubella IgG did not have any role in abortion and recurrent abortion among

women. However, it was felt that other reasons should be investigated like genetic factors, other infections that contributed to abortion like CMV, toxoplasmosis, and bacterial infections.

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**Conflict of Interest:** None

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